David Kelley
VP Marketing
Jan. 5th, 1995

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JAN 9 '95

Mr. William S. Caton
Acting Secretary
Federal Communications Commission
Office of the Secretary
1919 M Street, Room 222
Washington, DC 20554

Re: Docket No. 94-102
Compatibility with Enhanced 911
Emergency Calling Systems

Sir:

Ten copies of our comments for the above docket follow. Thank you.

Regards,

David Kelley

No. of Copies rec'd 0+9
List A B C D E

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Mr. William S. Caton
Acting Secretary
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1919 M Street, Room 222
Washington, DC 20554

Re: Docket No. 94-102 Compatibility with Enhanced 911 Emergency Calling Systems

We are honored to submit the following comments on Docket No. 94-102 PRM, *Compatibility with Enhanced 911 Emergency Calling Systems* for the consideration of the commission. We applaud the general tone of this PRM and the active involvement of the commission in this vital area of national interest. We look forward to, and fully expect, that various private interests will aggressively deploy a multitude of solutions which fit both the needs of the NENA and APCO community for position determination, as well as other private *for profit* opportunities which such technologies present.

Terrapin Corporation is very actively involved in developing and deploying technologies which address the fundamental concerns of the 911 emergency community in locating the position of wireless 911 callers. We expect to be commercially selling several suitable solutions employing our patented PINS technology within six months to the consumer market. Should the commission desire further information regarding our technical approach beyond that which is contained in the cited Driscoll report, we are willing provide it. In this response of comments, we constrain our self promotion and focus on specific issues facing the country and industry in meeting this PRM. Our general feeling is that private enterprise will rapidly solve this problem and that the technical guidelines proposed for mobile phone sets are in fact easily met within the stated time frames.

The gentle carrot and stick approach taken in this PRM provides a much needed emphasis to an evolving process which we believe many cellular operators will take of their own accord. As both a company and as private citizens, we are very pleased with the way that NENA and APCO have developed a balanced set of reasonable requirements, and taken the effort to outreach to the suppliers by means of the two JEMs co-sponsored by TIA and by PCIA. In summary then, we would urge the commission to set a more aggressive adoption schedule of the PRM requirements, combined with appropriate benefits for those who comply quickly.

Regards,

David Kelley

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Terrapin Corporation Comments on Docket # 94-102

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Re: Docket No. 94-102 Compatibility with Enhanced 911 Emergency Calling Systems

Scope and Background of Terrapin

Terrapin Corporation is a privately held company engaged in developing a position determination system suitable for use in small portable devices, for use indoors, and in dense urban environments. The device, called PINS, is suitable for incorporation in cellular phone handsets. The methodology employed involves a differential phase measurement of the un-synchronized 19 KHz stereo pilot tones recovered from several Commercial FM Broadcast Stations which is performed within the handset and used to autonomously determine position. The method is covered by issued US patents as well as additional un-issued patent applications and various international patents. The method is suitable for use with emissions found in the current AMPS cellular system as well as many proposed PCS modulations, however Terrapin has found that the propagation properties of the Commercial FM radio band have superior performance characteristics when operating indoors and in dense urban areas.

As a consequence of the above technical approach, Terrapin's perspective on this PRM is strictly in terms of wireless handset devices. Our comments reflect this bias and we will make no further mention of Section III of the PRM which deals with the needs of the 911 community in compatibility and in responding to calls placed through private branch exchanges (PBX), other than to voice our general agreement with the recommendations of the PRM. Further, maintenance of the ALI database (both PBX and cellular), is a fundamental issue in developing a total system design, and can benefit from the mandatory exchange of data and coordination proposed in this PRM.

Specific comments on the text of the PRM follow.

Section I Introduction, Item 2 and: Section IV, Item 38

While the immediate needs of the industry are driven by the very rapid increase in cellular phone use - and hence calls placed to 911 from such phones, limiting the scope of this PRM to only CMRS providing voice services is very short sighted in terms of National needs. Consider the influx of private communications devices which can connect to the PSN and which will call 911. In particular, note the rapid deployment plans of the Federal Highway Administration for advanced collision detection and reporting as a core goal of the ITS/IVHS[1] national program plan. We would strongly urge the commission that consideration be given to set minimum recommendations at least to communications equipment which may be deployed as original equipment vehicles to detect and report accidents. While it is premature to set any requirements, a primary goal of such an effort should be to minimize the fiscal impact of this impending market trend on the operators of 911 PSAPs.

Extending this PRM to any and all communication devices as discussed in Section IV, Item 38, while it might be very lucrative for our own company, strikes us as unreasonable. Besides the consideration of adding an undue cost burden to pagers, PDAs, etc., such a step could result in enough false alarm calls to the National 911 system to render it incapable of responding. We strongly believe that private industry will add "personal security" as a feature to many of these devices and that private *for-profit* PSAPs will handle such calls. We are aware of a number of private businesses currently preparing to deploy such services. We would suggest the commission take no action on devices which are not fundamentally intended to detect and alert such conditions as a PSAP might reasonably be expected to handle (as in the above paragraph). Further, there is a societal issue of equal access to consider if the market for such products is strictly to be found in high end equipment.

IV Item 32.

We strongly support the petition of TX-ACSEC and other states in asking the commission that PCS licensees be required to provide accurate position from the outset AND that a common signaling protocol be adopted in order that the PSAP resources can be conserved and that multiple technical approaches will not become a burden for the PSAP to support.

IV Item 33

We also agree with the arguments put forth by KSI, Inc. that a single standard could stifle technological development in this area. We would refine this point in asking the commission to recommend and require common signaling means and methods, while allowing that multiple technical approaches need to be encouraged. The reason for such encouragement transcends any private enterprise profit motivation. The simple reality of the problem is that different technological solutions are more suitable for different regions of the country and different communications technologies. In more rural areas, the position

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1 ITS Intelligent Transportation Systems, formerly IVHS Intelligent Vehicle Highway Systems

response needs of the PSAP can at times be very well served with "just the cell site & face" as a position. Our own corporate projection is that the market will be best served by a combination of both autonomous systems such as our own, infrastructure overlay systems such as that proposed by KSI, and a variety of specialty approaches in selected operating markets. We also expect that private industry, in providing the PSAPs with location as a service function, has a role to play.

IV Item 41

We support the concept of 911 availability in roamed areas to registered users. We do not support the concept that ANY phone, regardless of its legal state of registration with the carrier, should be capable of accessing 911. We are concerned with the liability issues raised by the use of never-registered or out of registration phones and the consumer perspective that such a phone should be able to access 911. Our understanding of the technical issues involved lead us to conclude that while it is easier to allow a "once registered" phone access to 911, this practice should be discouraged as being an act of fraud.

IV Item 44

We support the concept of 911 call priority, but are unqualified to comment on the specific cost of implementation which we believe to be prohibitive in the current AMPS system.

IV Item 45

We feel that the value of elevation is highly overrated. Our company has developed an auxiliary approach which does provide elevation data to within a single floor of accuracy which is currently the subject of a patent. However, we feel the additional manufactured cost of ≈$15 which this method requires is too great to overcome the limited benefit which a more reliable vertical dimension provides. In the very limited occurrences when this is important, it seems that a "sniffer"[2] is a much more cost effective solution.

IV Item 46

In the area of commenting on technical approach, it is difficult to be forthright without appearing to nay-say the competitive aspirations of others. Terrapin believes that its own technology's approach of using preexisting FM radio signals to determine position is superior to other systems. With a small size and an estimated per unit cost of only a few dollars in large volumes, we are convinced that it will become the pervasive "in the handset" solution. We believe much of the cellular industry shares this view but has a longer time frame to implement deployment than we do.

According the information provided in the report sited in item 47, it appears that NONE of the other systems is able to work inside buildings as the Terrapin PINS system can. The revised version of this report, available from the author, also does not describe any system

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2 This is a triangulation device, typically handheld, which is commonly used to home-in on the emissions of the cellular phone. Local response teams equipped with such devices provide a more cost effective solution than adding cost to millions of handsets which will never have occasion to use the additional circuits required.

but the Terrapin PINS as being able to operate indoors. We are not aware of any other technology approaches which have this ability, nor which have our level of accuracy in the vertical dimension. It is an undisputed fact that cellular users can often be found inside buildings. As cellular sales are now generally over 90% portable in nature, it is inconceivable that anyone would rely on a system which did not address this issue.

We also believe that triangulation methods and approaches which use time of arrival means at fixed receiver sites will be deployed in urban areas with sufficient population density. This may be the only way in which the majority of the existing 20 million users can be located when operating outdoors. There are concerns of privacy and "Big Brother" with such systems, but we believe that these issues can be suitably addressed.

In a similar vein, the use of cellular site and face represents a vast improvement but does not allow the PSAP operator to direct aid in most cases, and hence is of little value in and of itself. Combined with the information provided by other technologies listed in the Driscoll report, we believe it does have value and urge its immediate adoption.

IV Item 49, 50, 51

We find the deployment time frame for the latter stages to be too lax for such an urgent national problem. Also, the assumption in the text that the "strongest" signal is related to the proper base station is incorrect, as we are sure many carriers will comment to you.

With our own system's accuracy of better than 20 meters can be achieved but that the complexity of the equipment to do so is cost probative for this consumer application. We believe that with respect to our own technology, accuracy requirements of 125 meters in radius can be readily meet today with very inexpensive circuits. Under very harsh urban conditions, this figure may degrade to 300 meters. As stated elsewhere, we do not believe that accuracy in the vertical dimension is very useful, and would propose to avoid adding additional handset or network costs to achieve it. We generally support the "400 foot" number used in the position paper but feel that our own equipment will achieve better results, and thus fulfills the recommendation where it is "necessary to determine the precise location of a caller within a multistory structure."

We do not think that more precise requirements are needed. First, the proper requirements are still unclear within the industry itself. Second, additional accuracy is certain to be achieved in most of the proposed systems as additional operating experience is gained.

IV Item 52

We strongly support the concept of a ring back, and most especially in the case of a roaming user.

IV Item 53

We very strongly support the concept of a general standard format for the exchange of position data (from either the handset itself of the MTSO and the network) to the PSAP. We are, however, very concerned that the suggestion of an out of band signaling format such as SS7 may have negative effects on early deployment. Many of the private parties

who expect to setup private PSAP facilities will not be using common signal formats, nor SS7. We are concerned that their use of in band signaling may be at odds with the desires of the network switch providers and cause undue cost increases for the PSAP. We believe that the reliability will in fact be hampered should this occur.

IV Item 54

The requirement for ADA again argues that any modulation means using an out of band signaling format be viewed with a certain apprehension that it will restrict and discourage ADA users in direct conflict with Title II of the act. It should be noted that the preferred standard today is hopelessly outdated in terms of modern communications practice, and should not be promoted as a standard for the future.

IV Item 55

We support such labeling in concept but feel compelled to point out that such a label, affixed to a phone handset, must be evaluated in light of the network in which the phone is operating at that time. That is, if the phone relies on a network overlay which is not present, the phone, through no fault of the maker, would be unable to report position. This is of course further complicated by the issues of roaming. It should also be noted that providing the phone number on the phone face plate is no assurance that in fact the user can be called back, especially when in a roaming condition.

V Item 56

We generally agree with the position expressed by the commission and the industry as a whole that the act of dialing 911 removes from further consideration the privacy of the caller. We would further suggest that the commission extend the rules to include provisions for calling a party back after a 911 call has been received for a reasonable period of time and that such a returned call, made in good faith, should be should be provided a similar basis of protection in law. Specifically with respect to item 57, uniform federal regulations covering that case where the reception and transmission of the signal cross a state boundary would be helpful to all parties.

An Aside: Related to this issue is the subject of privacy when a private party PSAP is employed to locate a user's handset for various reasons. To protect the privacy of the owner, Terrapin proposes that the handset operator be forced to take some distinct action (such as pressing a button after being asked his location) to signal his acceptance that the other party may have his position information. This feature would be disabled in the case of calls placed to 911 (and for a period of time after such a call). In addition, in our own equipment, provisions are made to that a caller can provide a prearranged (by the owner) code word and determine the handset location without operator assistance. This feature is foreseen as being useful in stolen vehicle recovery where a private PSAP needs to locate the handset without operator intervention.

• End of Comments •

Respectfully Submitted
Jan. 6th, 1995

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